

## BIOGRAPHICAL SKETCH

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NAME: Rathbun, Colin Michael

eRA COMMONS USER NAME (credential, e.g., agency login): TODO

POSITION TITLE: Postdoctoral Researcher

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Hope College, Holland MI	B.S	05/2012	Chemistry
University of California, Irvine	Ph.D.	05/2018	Organic Chemistry
Colorado University at Boulder	Postdoctoral	Present	Chemical Biology

### A. Personal Statement

Methods and tool development have characterized my academic career and continue to inspire my future work. Throughout my undergraduate and graduate work I enjoyed designing solutions to problems in both organic chemistry and chemical biology. My undergraduate research involved development and study of new transition-metal catalyzed reactions involving carbon-carbon bond activation. Under the mentorship of professor Jeffrey Johnson, this work lead to some of the first kinetic characterizations of C-C bond activation reactions. I continued similar work in organometallic catalysis during the first two years of my graduate education in the lab of Professor Vy Dong. My work in the Dong Lab sought efficient transformations for the synthesis of carbohydrates; a longstanding problem in organic chemistry. Following advancement, I moved to the Prescher lab to pursue the development of new tools for bioluminescence imaging...

1. Rathbun, C. M.\*; Porterfield, W. B.\*; Jones, K. A.\*; Sagoe, M. J.; Reyes, M. R.; Hua, C. T.; Prescher, J. A. "Parallel screening for rapid identification of orthogonal bioluminescent tools." *ACS Cent. Sci.* *Accepted*.
2. Rathbun, C. M.; Prescher, J. A. "Bioluminescent Probes for Imaging Biology Beyond the Culture Dish." *Biochemistry*, **2017**, *56*, 5178. *Invited review*.
3. Rathbun, C. M.\*; Jones, K. A.\*; Porterfield, W. B.\*; McCutcheon, D. C.; Paley, M. A.; Prescher, J. A. "Orthogonal Luciferase--Luciferin Pairs for Bioluminescence Imaging." *J. Am. Chem. Soc.*, **2017**, *139*, 2351.
4. Steinhardt, R. C.; Rathbun, C. M.; Krull, B. T.; Yu, J. M.; Yang Y.; Nguyen, B. D.; Kwon, J.; McCutcheon, D. C.; Jones, K. A.; Furche, F.; Prescher, J. A. "Brominated Luciferins are Versatile Bioluminescent Probes." *ChemBioChem*, **2016**, *18*, 96.
5. Steinhardt, R. C.; O'Neill, J. M.; Rathbun, C. M.; McCutcheon, D. C.; Paley, M. A.; Prescher, J. A. "Design and Synthesis of an Alkynyl Luciferin Analogue for Bioluminescence Imaging." *Chem. Eur. J.*, **2016**, *22*, 3671.
6. Chen, I. H.; Kou, K. G. M.; Le, D. N.; Rathbun, C. M.; Dong, V. M. "Recognition and Site-Selective Transformation of Monosaccharides by Using Copper(II) Catalysis." *Chem. Eur. J.*, **2014**, *20*, 5013.
7. Lutz, J. P.; Rathbun, C. M.; Stevenson, S. M.; Powell, B. M.; Boman, T. S.; Baxter, C. E.; Zona, J. M.; Johnson, J. B. "Rate-Limiting Step of the Rh-Catalyzed Carboacylation of Alkenes: C-C Bond Activation or Migratory Insertion?" *J. Am. Chem. Soc.*, **2012**, *134*, 715.

8. Rathbun, C. M.; Johnson, J. B. "Rhodium-Catalyzed Acylation of Quinoliny Ketones: Carbon-Carbon Single Bond Activation as the Turnover Limiting Step of Catalysis." *J. Am. Chem. Soc.*, **2011**, 133, 2031.

## **B. Positions and Honors**

### **Positions and Employment**

1998–2000	Fellow, Division of Intramural Research, National Institute of Drug Abuse, Bethesda, MD
2000–2002	Lecturer, Department of Psychology, Middlebury College, Middlebury, VT
2001–	Consultant, Coastal Psychological Services, San Francisco, CA
2002–2005	Assistant Professor, Department of Psychology, Washington University, St. Louis, MO
2007–	Associate Professor, Department of Psychology, Washington University, St. Louis, MO

### **Other Experience and Professional Memberships**

1995–	Member, American Psychological Association
1998–	Member, Gerontological Society of America
1998–	Member, American Geriatrics Society
2000–	Associate Editor, Psychology and Aging
2003–	Board of Advisors, Senior Services of Eastern Missouri
2003–05	NIH Peer Review Committee: Psychobiology of Aging, ad hoc reviewer
2007–11	NIH Risk, Adult Addictions Study Section, members

### **Honors**

2003	Outstanding Young Faculty Award, Washington University, St. Louis, MO
2004	Excellence in Teaching, Washington University, St. Louis, MO
2009	Award for Best in Interdisciplinary Ethnography, International Ethnographic Society

## **C. Contribution to Science**

1. My early publications directly addressed the fact that substance abuse is often overlooked in older adults. However, because many older adults were raised during an era of increased drug and alcohol use, there are reasons to believe that this will become an increasing issue as the population ages. These publications found that older adults appear in a variety of primary care settings or seek mental health providers to deal with emerging addiction problems. These publications document this emerging problem but guide primary care providers and geriatric mental health providers to recognize symptoms, assess the nature of the problem and apply the necessary interventions. By providing evidence and simple clinical approaches, this body of work has changed the standards of care for addicted older adults and will continue to provide assistance in relevant medical settings well into the future. I served as the primary investigator or co-investigator in all of these studies.
  - a. Gryczynski, J., Shaft, B.M., Merrylye, R., & Hunt, M.C. (2002). Community based participatory research with late-life addicts. *American Journal of Alcohol and Drug Abuse*, 15(3), 222–238.
  - b. Shaft, B.M., Hunt, M.C., Merrylye, R., & Venturi, R. (2003). Policy implications of genetic transmission of alcohol and drug abuse in female nonusers. *International Journal of Drug Policy*, 30(5), 46–58.
  - c. Hunt, M.C., Marks, A.E., Shaft, B.M., Merrylye, R., & Jensen, J.L. (2004). Early-life family and community characteristics and late-life substance abuse. *Journal of Applied Gerontology*, 28(2), 26–37.
  - d. Hunt, M.C., Marks, A.E., Venturi, R., Crenshaw, W. & Ratonian, A. (2007). Community-based intervention strategies for reducing alcohol and drug abuse in the elderly. *Addiction*, 104(9), 1436–1606. PMID: PMC9000292
2. In addition to the contributions described above, with a team of collaborators, I directly documented the effectiveness of various intervention models for older substance abusers and demonstrated the importance of social support networks. These studies emphasized contextual factors in the etiology and maintenance of addictive disorders and the disruptive potential of networks in substance abuse treatment. This body of work also discusses the prevalence of alcohol, amphetamine, and opioid abuse in older adults and how networking approaches can be used to mitigate the effects of these disorders.

- a. Hunt, M.C., Merrylye, R. & Jensen, J.L. (2005). The effect of social support networks on morbidity among elderly substance abusers. *Journal of the American Geriatrics Society*, 57(4), 15–23.
  - b. Hunt, M.C., Pour, B., Marks, A.E., Merrylye, R. & Jensen, J.L. (2005). Aging out of methadone treatment. *American Journal of Alcohol and Drug Abuse*, 15(6), 134–149.
  - c. Merrylye, R. & Hunt, M.C. (2007). Randomized clinical trial of cotinine in older nicotine addicts. *Age and Ageing*, 38(2), 9–23. PMID: PMC9002364
3. Methadone maintenance has been used to treat narcotics addicts for many years but I led research that has shown that over the long-term, those in methadone treatment view themselves negatively and they gradually begin to view treatment as an intrusion into normal life. Elderly narcotics users were shown in carefully constructed ethnographic studies to be especially responsive to tailored social support networks that allow them to eventually reduce their maintenance doses and move into other forms of therapy. These studies also demonstrate the policy and commercial implications associated with these findings.
- a. Hunt, M.C. & Jensen, J.L. (2003). Morbidity among elderly substance abusers. *Journal of the Geriatrics*, 60(4), 45–61.
  - b. Hunt, M.C. & Pour, B. (2004). Methadone treatment and personal assessment. *Journal Drug Abuse*, 45(5), 15–26.
  - c. Merrylye, R. & Hunt, M.C. (2005). The use of various nicotine delivery systems by older nicotine addicts. *Journal of Ageing*, 54(1), 24–41. PMID: PMC9112304
  - d. Hunt, M.C., Jensen, J.L. & Merrylye, R. (2008). *The aging addict: ethnographic profiles of the elderly drug user*. NY, NY: W. W. Norton & Company.

#### **Complete List of Published Work in MyBibliography:**

<http://www.ncbi.nlm.nih.gov/myncbi/browse/collection/45972964/>

#### **D. Research Support**

##### **Ongoing Research Support**

R01 DA942367 Hunt (PI) 09/01/08–08/31/16

Health trajectories and behavioral interventions among older substance abusers

The goal of this study is to compare the effects of two substance abuse interventions on health outcomes in an urban population of older opiate addicts.

Role: PI

R01 MH922731 Merrylye (PI) 12/15/07–11/30/15

Physical disability, depression and substance abuse in the elderly

The goal of this study is to identify disability and depression trajectories and demographic factors associated with substance abuse in an independently-living elderly population.

Role: Co-Investigator

Faculty Resources Grant, Washington University 08/15/09–08/14/15 Opiate Addiction Database

The goal of this project is to create an integrated database of demographic, social and biomedical information for homeless opiate abusers in two urban Missouri locations, using a number of state and local data sources.

Role: PI

##### **Completed Research Support**

R21 AA998075 Hunt (PI) 01/01/11–12/31/13

Community-based intervention for alcohol abuse

The goal of this project was to assess a community-based strategy for reducing alcohol abuse among older individuals.

Role: PI